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OFFSHORE MARINE OBSERVATION OF WILLOW PTARMIGAN, INCLUDING WATER LANDINGS, KUSKOKWIM BAY, ALASKA

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ABSTRACT.—We report an observation of Willow Ptarmigan (*Lagopus lagopus*) encountered 8 to 17 km from the nearest shoreline on Kuskokwim Bay, Alaska, on 30 August 2003. The ptarmigan were observed flying, landing on our research vessel, and landing and taking off from the water surface. We also report on one other observation of ptarmigan sitting on the water surface and other marine observations of ptarmigan from the North Pacific Pelagic Seabird Database. These observations provide evidence that Willow Ptarmigan are capable of dispersing across large bodies of water and landing and taking off from the water surface. *Received 19 July 2004, accepted 4 January 2005.*

Willow Ptarmigan (*Lagopus lagopus*) have a Holarctic distribution and are found throughout much of Alaska, typically occupying alpine and arctic tundra (Hannon et al. 1998). In contrast to the residential habits of most other grouse species (Gruys 1993, Hannon et al. 1998), Willow Ptarmigan are known to make seasonal migrations that may cover distances of several hundred kilometers. Although their wing morphology and muscle composition suggest that they are better adapted to longer migrations and sustained flight than other galliforms (Drovetski 1996), galliforms generally are considered to have limited ability for sustained flight (Tobalske et al. 2003). For Willow Ptarmigan, migration between breeding and wintering habitats typically occurs in early fall, with return migration occurring in spring (Hannon et al. 1998); Gruys (1993) reported that Willow Ptarmigan migrating from summer to winter habitats moved in flocks of up to 200 birds. Ptarmigan, upland birds not commonly associated with water, normally do not swim or dive (Hannon et al. 1998), but Dixon (1927) observed a Willow Ptarmigan wade into shallow creek water to forage on insects, and Hannon et al. (1998) report that 1-day-old chicks can swim if they fall into water.

Because ptarmigan are not usually associated with water and generally exhibit limited flight endurance, it is not clear whether ptarmigan would be able to migrate long distances over bodies of water. Determining the extent of this ability may be a key element to understanding dispersal patterns and population structure. Rock Ptarmigan (*L. muta*) breeding on the Aleutian Islands, for example, are characterized by genetic divergence among major island groups with little gene flow between island populations (Holder et al. 2000, 2004). Holder et al. (2000) further pointed out that no inter-island movement of individual ptarmigan has ever been reported, although the distances between islands are often less than those covered by migrations of inland ptarmigan.

On 30 August 2003, during a survey for pelagic juvenile salmon in Kuskokwim Bay, Alaska (60° 0′ N, 162° 15′ W), we encountered a group of 100 to 125 Willow Ptarmigan. We observed the ptarmigan for approximately 2 hr (08:00 to 10:00 Alaska Standard Time) as we cruised south along the 162° 16′ W longitude line. We first encountered the ptarmigan when we were approximately 8 km from shore. Our track was roughly parallel to the east coast of Kuskokwim Bay and distance to shore ranged from 8 to 17 km. Initially, two ptarmigan (a female and male) landed on our vessel and rested for approximately an hour before flying away. Over the next hour (09:00–10:00), approximately 125 birds repeatedly flew around the vessel. A few landed on the vessel and rested for short periods (<15 min) before flying off in the distance and returning to the vicinity of the boat (Fig.

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FIG. 1. Willow Ptarmigan in flight, on a research vessel, and on the water, Kuskokwim Bay, Alaska, 30 August 2003. See additional photographs at www.absc.usgs.gov/research/Fisheries/Western_Alaska/ptarmigan.htm.

1). All birds appeared to be exhausted after landing on the vessel, exhibiting rapid breathing with open beaks. At least 10 ptarmigan were observed landing on the water surface, resting (<10 min), then taking off from the water surface. When we encountered the ptarmigan, the sea was calm, winds were light, and the sky was overcast. The nearest weather station, at Cape Newenham on the southern boundary of Kuskokwim Bay and approximately 120 km from our location, reported calm winds, visibility of 16 km, and an air temperature of 13° C (Federal Aviation Administration automated weather monitoring station).

To determine whether other ptarmigan had been observed at sea or landing on water, we queried the North Pacific Pelagic Seabird Database (www.absc.usgs.gov/research/NPPSD/), which contains pelagic seabird survey data collected over the last 30 years in the North Pacific Ocean, Bering Sea, and adjacent waters. Of 57 ptarmigan records—including 16 Willow Ptarmigan, 6 Rock Ptarmigan, and 35 unidentified ptarmigan—all were associated with shorelines of the Chuckchi Sea, Arctic Ocean, or Norton Sound, Alaska. Only 1 ptarmigan was sitting on the water, 12 were not classified according to behavior, 12 were flying in a consistent heading, 9 were flying below the crests of waves or swells (suggesting flight over water), 2 were bathing, 15 exhibited courtship behavior (likely terrestrial observations), and 6 were sitting or standing followed by flushing (likely terrestrial observations). Of the behaviors reported, 12 appear to have been associated with water, including sitting on water, bathing, or flying below wave crests. The single record of a ptarmigan sitting on the water was of a Rock Ptarmigan observed on 26 June 1976 at Kasegaluk Lagoon (68° 51′ N, 165° 50′ W), adjacent to the Chukchi Sea.

It is not clear why the ptarmigan we observed on Kuskokwim Bay were flying offshore. Since the weather was calm at the time and had been so for several days, it is unlikely that this group had been displaced by wind. Willow Ptarmigan are common on the coastal plain adjacent to Kuskokwim Bay and typically migrate in September—from the coastal plain to mountains in the east (approximately 90 km; M. Rearden pers. comm.). It seems likely that the ptarmigan we encountered had gathered as they migrated from breeding habitats on the coastal plain to wintering habitats.

Given the distribution of ptarmigan on offshore islands, such as the Aleutian Islands, Alaska, it is not unlikely that dispersal occurs

over water. Understanding the dispersal capabilities and patterns of animals is a critical step in examining population structure and metapopulation dynamics (Weins 1996). Dispersal among islands is regulated by the dispersal capabilities of a species and the distance between islands. Our observation of Willow Ptarmigan on Kuskokwim Bay and the observation of Rock Ptarmigan at Kasegaluk Lagoon are the first records of ptarmigan not only landing and sitting on the water surface, but also successfully taking off after resting on the water surface. These observations add to our understanding of dispersal by ptarmigan and may provide insight concerning dispersal of ptarmigan across large bodies of water.

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